

Summary of Present Invention

The present invention is directed to a method and apparatus for determining whether or not an element in an integrated circuit is a feedback element. The apparatus comprises a computer capable of being configured to execute a rules checker program. When the rules checker program is executed by the computer, it analyzes information relating to the network and determines whether or not an element in the integrated circuit is a feedback element. In accordance with the preferred embodiment of the present invention, the rules checker program performs a plurality of checks to determine whether or not an element, such as a FET, in the integrated circuit is a feedback element. The order in which the checks are performed is intended to maximize efficiency in determining whether or not an element being evaluated is a feedback element, although the present invention is not limited with respect to the order in which the checks are performed.

Discussion of Rejections

The Examiner is thanked for the thorough review of the present application, and the indication that claims 3-10, 12-13, 16-18, and 20-21 contain allowable subject matter (Office Action, paragraph 22). The Office Action, however, rejected all claims 1-22 under 35 U.S.C. §112, second paragraph. Claims 1-2, 11, 14-15, 19, and 22 were rejected under 35 U.S.C. §102 as being anticipated by either Kuhns, Schuelein, or McElvain. For the reasons set forth below, Applicant respectfully traverses these rejections.

Turning now to the technical rejections set forth in paragraphs 2 through 7 of the Office Action, the Office Action rejected claims 1-22 under 35 U.S.C. §112. As set forth in paragraph 4 of the Office Action, claims 1-22 are rejected under 35 U.S.C. §112, second paragraph. It, indeed, appears that this is the intended rejection of the Office Action. However, paragraphs 2 and 3 recite 35 U.S.C. §112, first paragraph. It appears to the undersigned, however, that the intended rejection was under the second paragraph of 35 U.S.C. §112, as the rejections did not object to the language or content of the specification,

but rather the claims. For the reasons set forth below, Applicant respectfully traverses the rejection under 35 U.S.C. §112.

With regard to claim 1, paragraph 5 of the Office Action states that “the claim does not appear to recite any features other than the concept already set out in the preamble... thus rendering the claim is incomplete and vague.” Applicant submits that this rejection is improper and should be withdrawn. In this regard, there is no legal prohibition against repeating in the body of a claim elements and features that were recited in a preamble.

Further, the law provides that language in a preamble is often not deemed to be limiting upon a claim. For this reason, the Patent Office frequently ignores language set forth in a preamble, concentrating instead on the body of the claim. To ensure that the elements and features recited in the preamble that are intended to be limitations upon the claim are treated as such, the Applicant drafted claim 1 in the manner set forth in the application.

To traverse this rejection in another manner, it appears from the rejection set forth in paragraph 5 of the Office Action that claim 1 would not have been rejected under 35 U.S.C. §112 if the preamble merely recited “an apparatus comprising,” as the recited “logic...” that follows the preamble of claim 1 would not have been repetitive of the preamble. Simply stated, it makes no logical sense to reject claim 1 on the basis of 35 U.S.C. §112, second paragraph, merely because the claimed preamble recites additional features. For at least the forgoing reasons, the rejection of claim 1 should be withdrawn.

With regard to claim 14, paragraph 6 of the Office Action rejected this claim under 35 U.S.C. §112, second paragraph because the claim preamble recited the term “steps” (in plural form) yet only one step followed in the claim. Applicant has amended claim 14 herein to correct this typographical error. Accordingly, the rejection of claim 14 under 35 U.S.C. § 112 should be withdrawn.

claim 1 was taken as exemplary

Applicant further notes that the Office Action did not set forth a specific or particular rejection to Independent Claim 19. Therefore, the rejection of claims 19-22 under 35 U.S.C. §112, should be withdrawn.

Rejection of Claims Based on Kuhns

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Paragraphs 13 and 14 of the Office Action rejected claims 1, 14, and 19 under 35 U.S.C. §102(b) as being anticipated by Kuhns. In forming this rejection, however, the Office Action specifically rejected only claim 14, effectively ignoring claims 1 and 19. In doing so, the Office Action stated that "claims 1 and 19 are considered rejected but such is omitted for the sake of brevity." Instead, the Office Action justified this rejection stating that claim 14 is exemplary. Applicant respectfully traverses this summary treatment of the claims. In this regard, claim 14 is directed to a method, while claim 1 is directed to an apparatus, and claim 19 is directed to a computer program. Apparatus, method, and computer program claims are not coextensive. The fact that a prior art reference might disclose a claimed method does not *ipso-facto* mean that the same prior art reference discloses an apparatus.

To illustrates this point, the Wright Brothers invented and disclosed a method for flight with a fixed-wing aircraft. However, the method for flying with a fixed-wing aircraft, as disclosed by the Wright Brothers, certainly does not anticipate all later developed apparatus for flying. In the same way, the mere fact that Kuhns may disclose the method of claim 14 does not, as a matter of law, mean that it also discloses the apparatus of claim 1 and computer program of claim 19. Accordingly, Applicant respectfully submits that the rejections of claim 1 and 19 be withdrawn unless and until a more definite statement regarding these claims is provided by the Patent Office.

applicant's own spec is written in same coextensive manner

With regard to the rejection of claim 14, the Office Action states that Kuhns discloses the claimed method at page 230, in the "testability rules" section. Applicant respectfully disagrees. In this regard, claim 14 (as amended) recites:

14. A method for determining whether or not an element of a network comprised in an integrated circuit is a feedback element, the method comprising the step of:
analyzing information relating to the network to determine whether or not an element comprised in the integrated circuit is a feedback element.

In the cited section of Kuhns, Kuhns states "a prime target for this type of analysis is the identification of feedback loops. In analog circuits and systems it is inevitable that some loops will exist. These loops could be anything from a servo control system to a simple resistive feedback circuit for an operational amplifier..."

It is clear from the quoted portion of Kuhns that the system of Kuhns is discussing the identification of "feedback loops," as opposed to disclosing a method for determining whether or not an element within an integrated circuit is a feedback element. For at least these reasons, the disclosure of Kuhns does not anticipate the invention defined by claim 14. Accordingly, the rejection should be withdrawn.

Rejection of Claims Based on Schuelein

The Office Action also rejected claims 1-2, 11, 14-15, 19, and 22 under 35 U.S.C. §102(e) as being anticipated by Schuelein. Applicant respectfully traverses this rejection for the reasons set forth below. First, and as a matter of law, Applicant traverses the application of this rejection as to claims 14-15, 19, and 22. Like the rejection of claims 1 and 19, base on the Kuhns article, the Office Action has failed to give independent analysis to the method and computer program claims in its application of the Schuelein patent. In this regard, paragraph 16 of the Office Action sets forth a rejection of claim 1 as an exemplary claim, and alleges that it need not address the other independent claims of the patent application. Again, as a

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matter of law, Applicant respectfully submits that apparatus, method, and computer program claims may not be construed coextensively, and the Applicant is entitled to a specific rejection of these other claims (claims 14-15, 19, and 22).

With regard to Independent Claim 1, the Office Action states that Schuelein at column 10, lines 17-18 discloses “an apparatus for determining whether or not an element of a network comprised in an IC is a feedback element, the apparatus comprising: logic configured to analyze information relating to the network to determine whether or not an element comprised in the IC is a feedback element.” Applicant respectfully traverses this application of Schuelein as being completely unfounded and improper. In this regard, the cited portion of Schuelein (i.e., column 10, lines 17-18) in total states “the step of finding or identifying a target transistor of the present invention involves determining whether a gate electrode is floating...”

As can be readily verified from even a cursory reading of this portion of Schuelein, this portion of Schuelein is wholly devoid of any teaching of an apparatus that is configured to identify feedback elements within an IC, or whether a given element within an integrated circuit is a feedback element. Indeed, the cited portion of Schuelein is wholly devoid of even the bare mention of a feedback element. Accordingly, the rejection of claim 1 should be withdrawn. Since claims 2 and 11 depend from claim 1, the rejection of these claims should be withdrawn for at least the same reason.

Accordingly, the rejections of claims 1-2, 11, 14-15, 19, and 22 as being anticipated by Schuelein should be withdrawn for at least the reasons set forth above.

Rejection of Claims Based on McElvain

Paragraphs 17 and 18 of the Office Action rejected claims 1, 14, and 19 under 35 U.S.C. §102(e) as being clearly anticipated by McElvain. For the reasons set forth below,

Applicant respectfully disagrees. Before addressing the specific traversal, however, the undersigned points out that the rejection of claims 1 and 19, based on McElvain, suffer the same fundamental legal flaw as discussed above. In this regard, the Office Action evaluated only claim 14, stating it was an exemplary claim, and that claims 1 and 19 were "omitted for the sake of brevity." Again, method claims, apparatus claims, and computer program claims are not coextensive, and the rejection of a method claim does not necessarily lead to the rejection of companion apparatus or computer program claims. According, Applicant submits that he is entitled to receive specific treatment of each independent claim being rejected.

Notwithstanding, the Office Action rejected claim 14 as being anticipated by McElvain, and cited column 6, lines 38-65 and column 7, lines 15-16 of the McElvain patent as disclosing a method for determining whether or not an element of a network comprised in an IC is a feedback element. The cited portion of McElvain actually states:

FIG. 5 illustrates an inverter 22 configured in accordance with a prior art technique for preventing gate charging. The inverter 22 is implemented using a PMOS transistor 4 and an NMOS transistor 6 where each transistor has a gate electrode, a drain electrode, and a source electrode. The source electrode of the PMOS transistor 4 is coupled to Vcc. The input of the inverter (node A) is coupled to the gate electrode of the PMOS transistor 4 and the gate electrode of the NMOS transistor 6. The output (node B) of the inverter is coupled to the drain electrode of the PMOS transistor 4 and the drain electrode of the NMOS transistor 6. Both the NMOS transistor 6 and the PMOS transistor 4 are in need of gate charging protection. Accordingly, the input of the inverter is coupled to the cathode of one of the NAC diodes 8, and the anode of the NAC diode 8 is coupled to the substrate of the semiconductor die.

FIG. 6 illustrates an inverter configured in accordance with the teachings of the present invention. In this embodiment, the inverter is implemented using a PMOS transistor 40 that includes a gate electrode, a source electrode and a drain electrode. The inverter also includes an NMOS transistor 44 that includes a gate electrode, a drain electrode and a source electrode. Both the PMOS transistor 40 and the NMOS transistor 44 are target transistors in that both transistors (40, 44) require gate charging protection. The source electrode of the PMOS transistor 40 is coupled to a first reference voltage (e.g., Vcc). The input of the inverter (node A) is coupled to the gate electrode of the PMOS transistor 40 and a gate electrode of the NMOS transistor 44. The output of the inverter (node B) is coupled to the drain electrode of the PMOS

transistor 40 and the drain electrode of the NMOS transistor 44. The source electrode of the NMOS transistor 44 is coupled to a second reference voltage (e.g., ground potential).

...

The PMOS transistor 58 includes a gate electrode, a drain electrode and a source electrode.

As can be readily verified from even a cursory reading of the cited portion of McElvain, there is absolutely no mention of a method for determining whether a given element is a feedback element. There is some broad reference to feedback paths and that registers which do not have feedback paths are considered to be non-state registers. However, it is a stretch (to say the least) to equate the mere mention of a feedback path to the disclosure of a method for determining whether a given element within a netlist is a feedback element. Consequently, Applicant respectfully submits that this disclosure of McElvain does not anticipate independent claim 14. Accordingly, for at least these reasons, the rejection of claim 14 as being anticipated by McElvain should be withdrawn.

Any Ensuring Office Action Should be Made Non-Final

The undersigned notes that, should the Patent Office mail another Office Action that sets forth specific rejections to the claims that were ignored (or omitted herein for the sake of brevity), that any such ensuing Office Action should be made non-Final, as rejections set forth therein will constitute "new grounds" and will not have been necessitated by any amendments herein.

Prior Art Made of Record

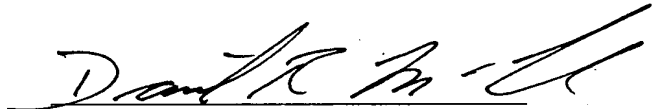
The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

Applicants respectfully submit that all claims are now in proper condition for allowance, and respectfully request that the Examiner pass this case to issuance. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this response. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to Deposit Account No. 20-0778.

Respectfully submitted,



Daniel R. McClure
Registration No. 38,962

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, L.L.P.
Suite 1750
100 Galleria Parkway N.W.
Atlanta, Georgia 30339
(770) 933-9500

Annotated Version of the Claims Illustrating Changes Made Thereto

Claim 14 has been amended as follows (where underlining denotes additions and brackets denote deletions).

14. (Once Amended) A method for determining whether or not an element of a network comprised in an integrated circuit is a feedback element, the method comprising the [steps] step of:

analyzing information relating to the network to determine whether or not an element comprised in the integrated circuit is a feedback element.